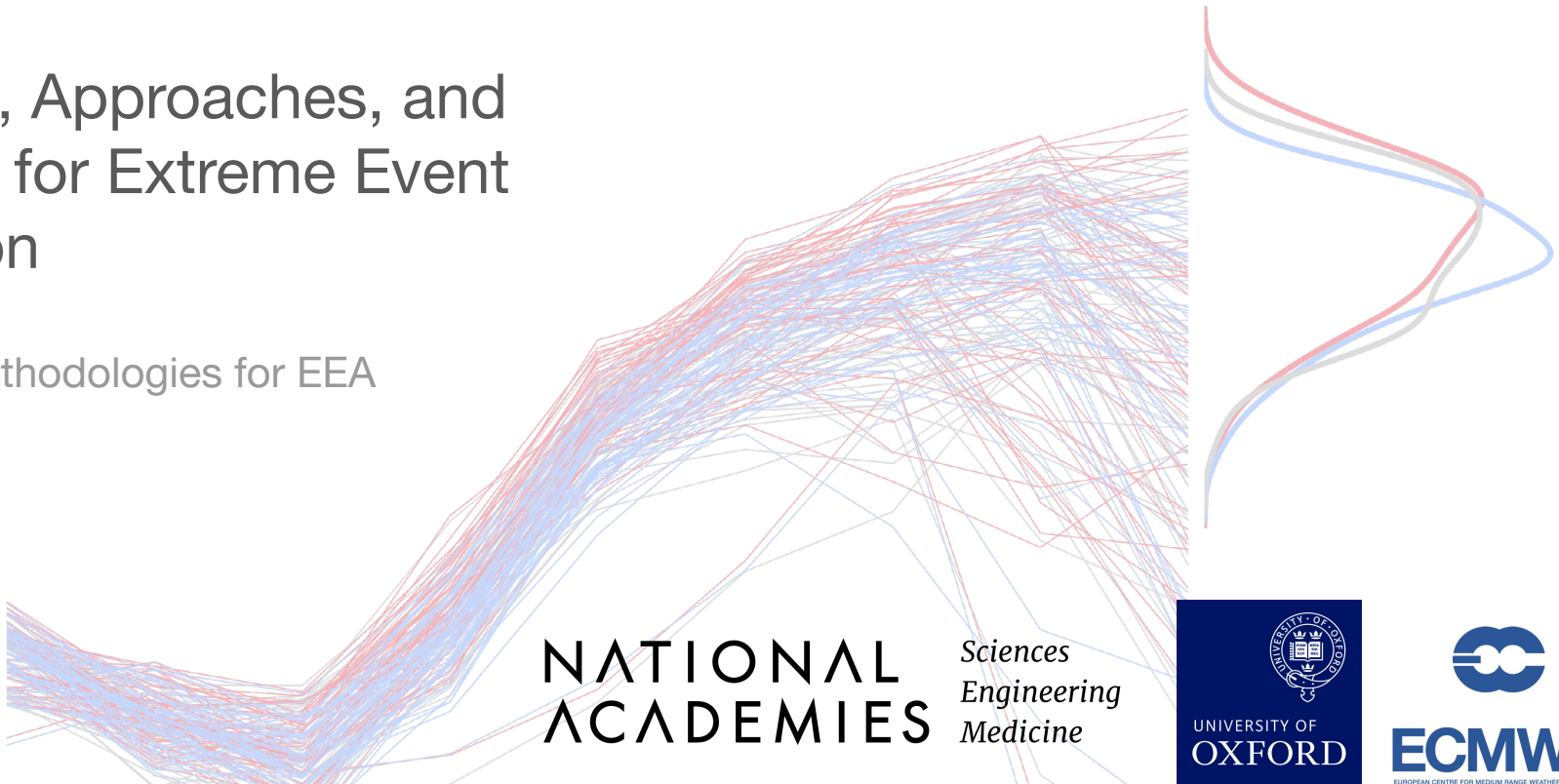


# Forecast-based attribution

Methods, Approaches, and  
Datasets for Extreme Event  
Attribution

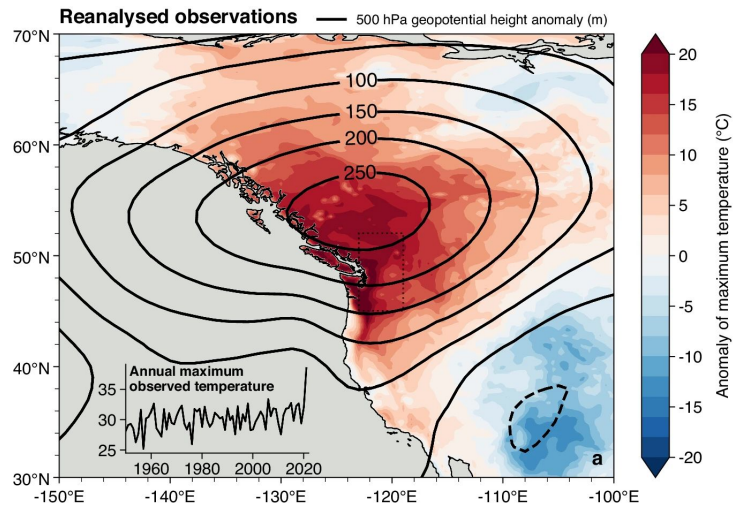
Emerging Methodologies for EEA



NATIONAL  
ACADEMIES

*Sciences  
Engineering  
Medicine*



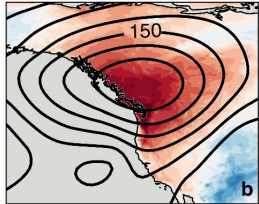


# Why?

Use exactly the same models  
that forecast the weather

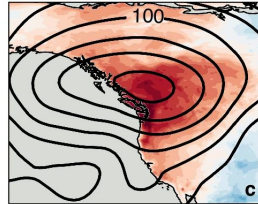
**Forecasts initialised**  
2021-06-26

**Lead**  
3 days



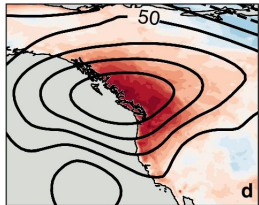
2021-06-22

**Lead**  
7 days



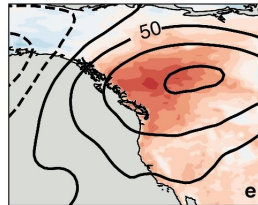
2021-06-18

**Lead**  
11 days



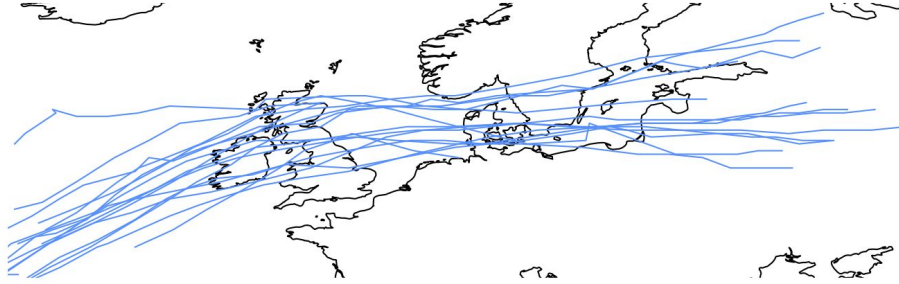
2021-05-01

**Lead**  
1-4 months



- **Dynamical response**
- Storyline 🤝 Probabilistic
- Impacts

Pre-industrial



Present-day



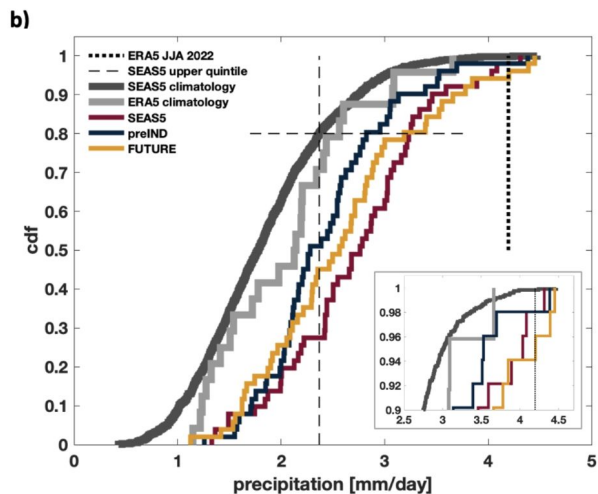
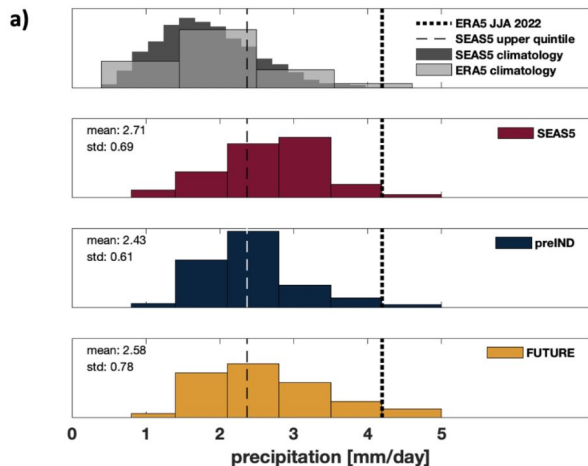
Future



# How?

Re-initialised counterfactual weather or climate forecasts in past and future climates

- Perturb ICs & BCs
- Can use forecast ensemble to understand event drivers
- Use counterfactual forecasts to quantify response



# Where?

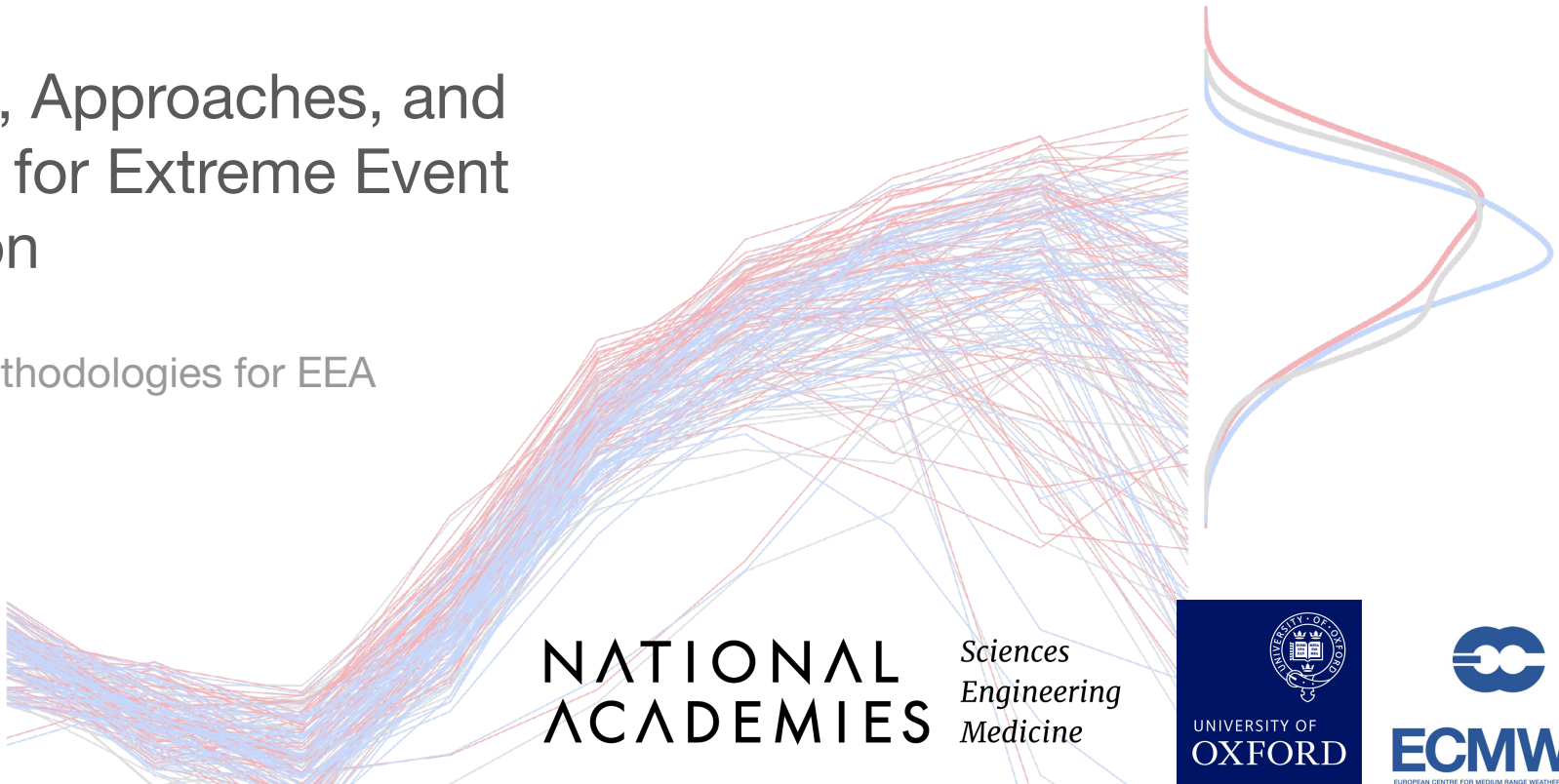
Current key future directions

- Atmospheric re-initialisation
- Cross-scale synthesis
- Aerosol attribution

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